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ABSTRACT

A project was conducted to develop a model vocational agriculture curriculum for high schools in north central Washington. During the project, units of instruction were developed that addressed the job skills needed by entry-level workers to fill jobs existing in agricultural occupations in the north central region of Washington. A pilot test of the curriculum developed was begun in two high schools during the 1984-1985 school year and is slated to continue throughout the year. (This report includes the project-developed model curriculum and its design; a statement of the philosophy of the curriculum; and descriptions of courses in the following subject areas: agricultural science, horticulture, advanced horticulture, agricultural welding, small engines, and power mechanics. Each course description contains lists of unit topics; estimated unit completion times; lists of student learning objectives addressed in each unit; and a list of suggested references, instructional materials, and learning activities.) (MN)

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DEVELOPING A MODEL VOCATIONAL AGRICULTURE CURRICULUM FOR HIGH SCHOOLS IN NORTH CENTRAL WASHINGTON

FINAL REPORT
Project No. 84-AWB(231)NB

Curriculum Development Project
Condcuted Under Public Law 94-482

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December 1, 1984

Research Coordinating Unit
WASHINGTON STATE COMMISSION FOR VOCATIONAL EDUCATION
OLYMPIA, WASHINGTON 98504

CE041552

Final Report

Project No. 84-AWB(231)NB

"DEVELOPING A MODEL VOCATIONAL AGRICULTURE CURRICULUM FOR HIGH SCHOOLS IN NORTH CENTRAL WASHINGTON"

Curriculum Development Project
Conducted Under
Public Law 94-482

The project reported herein was performed pursuant to a grant from the Research Coordinating Unit of the Washington State Commission for Vocational Education. Contractors undertaking such projects under the Commission for Vocational Education sponsorship are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Commission for Vocational Education position or policy.

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December 1, 1984

ACKNOWLEDGMENTS

This comprehensive vocational agriculture curriculum was developed under the direction of Stephen Rasmussen, Vocational Director, in cooperation with school administrators and vocational teachers from Eastmont and Wenatchee School Districts.

Special thanks go to:

Richard L. Stimpson, Superintendent, Eastmont School District
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The Vocational Agriculture Advisory Committee, Eastmont High School and Wenatchee High School

TABLE OF CONTENTS

Summary of the Report	1
Body of the Report	2
A. Problem Area	2
B. Objectives	2
C. Project Design and Procedures	3
D. Results	3
E. Evaluation of the Project	3
F. Conclusions	3
G. Project Dissemination	4
Attachment A - Curriculum Outline	5

SUMMARY OF THE REPORT

A. Time Period: May 1, 1984 to December 31, 1984

B. Objectives:

Sub-Objective 1: To develop units of instruction that reflect both student and employment needs for successful entry level employment in agriculture occupations in North Central Washington.

Sub-Objective 2: To provide time and funds to employ certified vocational agriculture teachers and clerical support to complete a quality product.

Sub-Objective 3: To pilot the curriculum in the Eastmont and Wenatchee High Schools during the 1984-85 school year.

C. Summary of Activities:

The present vocational agriculture curriculum was reviewed by program staff, administrators responsible for curriculum, Superintendent of Public Instruction (SPI) specialists, and vocational agriculture advisory committees. The total vocational agriculture curriculum was rewritten.

D. Summary of Results; Accomplishments:

Following the review and rewriting, a new comprehensive four year vocational agriculture curriculum emerged. The format for each curriculum area includes the topic name, units, unit time-line, unit student learning objectives (SLO's), and references used for each.

The final curriculum was reviewed and approved by each advisory committee. Implementation of the curriculums began August 29, 1984 and will continue throughout the 1984-85 school year.

E. Major Conclusions and Recommendations:

The value of evaluating the entire vocational agriculture curriculum cannot be stressed enough. Outdated practices and materials were replaced with new. The new curriculums will enhance the employability of students enrolled in the program.

The attached curriculum is recommended for schools in North Central Washington or schools with similar agriculture industries and communities.

BODY OF THE REPORT

A. Statement of Problem:

The agriculture industry in the Wenatchee area is going through and experiencing a great amount of change. In order for the public schools to train high school students for entry level employment it is critical that vocational agriculture curriculums reflect these changes and become part of the employment solution, not the problem. The last time a major project such as this was undertaken in either district was 15 years ago. The Vocational Agriculture Advisory Committee recommended we pursue this project.

Presently, Eastmont and Wenatchee High Schools enroll 2,300 students of which approximately 500 students are enrolled in the Vocational Agriculture program or 1/5 of all students.

The Wenatchee area derives its primary source of income from agriculture with the largest areas including the agribusiness sectors: Chemicals and Fertilizer, Sales and Service, Processing and Handling, Refrigeration and Storage, Fabrication, and Transportation.

Curriculum presently reflect a heavy emphasis on the production side of agriculture and little on the agribusiness side. With most entry-level employment positions for high school graduates in the agribusiness sector, we are in need of new curriculums and methods of incorporating them in our vocationl agriculture programs.

B. Objectives:

To develop a comprehensive vocational agriculture curriculum for use in Vocational Agriculture Programs throughout North Central Washington and the state of Washington. Items included are curriculums, SLO's, SOE activities, student leadership (FFA) involvement, and resource and reference materials.

Sub-Objectives

To develop units of instruction that reflect both student and employment needs for successful entry level employment in agriculture occupations in North Central Washington by August 24, 1984.

To provide time and funds to employ certified vocational agriculture teachers and clerical support to complete a quality product.

To begin the project May 1, 1984 and with completion set for August 24, 1984 at which point implementation will commence.

To pilot the total program in Eastmont and Wenatchee High Schools during the 1984-85 school year.

C. Description of the Project Design and Procedures:

The curriculum project was designed to review and update the present vocational agriculture curriculum in Eastmont and Wenatchee School Districts.

In a combined effort between Eastmont and Wenatchee the entire curriculum was reviewed and a new comprehensive four year vocational agriculture curriculum emerged. Input was received from school administrators, curriculum specialists, teachers, advisory committee members and employment agencies.

D. Results and Accomplishments of the Project:

A new four year vocational agriculture curriculum was written and implemented into the programs in each high school.

The curriculum was redesigned to include the topic name, units, unit timelines, unit student learning objectives (SLO's) and references used. Student leadership (FFA), supervised occupational experience (SOE) activities, etc. were included in each course.

E. Evaluation of the Project:

Upon completion the curriculum was reviewed by each advisory committee, the project director, curriculum specialists, and teachers. Tentative approval was received by each before the final draft was approved.

F. Conclusions, Implementation, and Recommendations:

The results of undertaking this challenge has been positive. Receiving the RCU grant provided the necessary impetus to see it through from start to finish.

The addition of a new philosophy, which is reflected throughout the new and/or revised comprehensive vocational agriculture curriculums, has provided a new focus for the programs in each high school.

All course offerings provide teachers with a basic core of materials to teach from yet allowing them the latitude to adapt it to their own unique teaching style.

G. Project Dissemination Plans:

Through the state vocational agriculture network we plan to make it known that a curriculum project has been completed. Interested parties can contact the Commission for Vocational Education (CVE) or the Eastmont School District for copies and specific information regarding the curriculum.

A specific notice will be submitted to the Vocational Agriculture Hotline. The Hotline serves as a newsletter for the vocational agriculture teachers in the state of Washington.

Attachment A

EASTMONT SCHOOL DISTRICT

460 NE 9th Street
East Wenatchee WA 98801

MODEL VOCATIONAL AGRICULTURE CURRICULUM

FOR

NORTH CENTRAL WASHINGTON

August 1984

EASTMONT SCHOOL DISTRICT 206

TABLE OF CONTENTS

INTRODUCTION AND CURRICULUM DESIGN	3
STATEMENT OF PHILOSOPHY	4
INDIVIDUAL COURSE DESCRIPTIONS	
Agriculture Science 1	5
Agriculture Science 2	8
Agriculture Science 3	11
Agriculture Science 4	14
Horticulture 1	17
Advanced Horticulture 2	20
Agriculture Welding	25
Small Engines	27
Agriculture Power Mechanics	29

INTRODUCTION

The following program curriculum entitled "Model Vocational Agriculture Curriculum for North Central Washington" is the result of many dedicated teachers and administrators working together to develop an up-to-date curriculum model for schools with Vocational Agriculture Programs in North Central Washington.

Agriculture, like most other industries throughout the state and county, is going through a period of great change. We have attempted to implement these changes so that students completing the program will be more employable.

The format for each course description is uniform throughout. Each is complete with course name, units, unit student learning objectives, and course references.

The content for each course includes all components of a total Vocational Agriculture curriculum including student leadership (FFA), supervised occupational experience (SOE), lab/shop experiences, and classroom components. It is essential that computer aided instruction be incorporated as a teaching tool and station in every course.

PHILOSOPHY FOR VOCATIONAL AGRICULTURE

We believe that:

The Vocational Agriculture program is designed to provide entry-level knowledge and skills for students planning a career in agriculture and/or related occupations. The instructional program includes one or more courses in animal science, plant science, soil science, agricultural mechanics and horticulture.

We believe that:

The instructional program in Vocational Agriculture be based on the needs and interests of individuals and groups served. It is developed in view of actual or anticipated opportunities for employment in agricultural and/or related occupations. The program is also designed to contribute to the broad educational objectives of the public school system.

We believe that:

The objectives of Vocational Agriculture are:

1. To develop agricultural competencies needed by individuals who live on a farm or who plan to engage in production agriculture.
2. To develop competencies in the agricultural sciences which are needed by individuals who plan to engage in agricultural-related occupations other than production agriculture.
3. To develop knowledge, skills and abilities in the area of agriculture mechanics.
4. To develop a good foundation for and a desire to continue education beyond the high school.
5. To assist with the vocational guidance of high school youths.
6. To develop those abilities in human relations and leadership training skills which are essential in agricultural occupations.
7. To complement the broad educational objectives of the secondary school by illustrating practical applications of academic subjects such as science, mathematics and economics upon agriculture and the student.

AGRICULTURE SCIENCE 1

Unit 1 - Animal Science (10 weeks)

A. Introduction to livestock industry
B. Breeds of livestock
C. Livestock terms and sex classifications
D. Selection
E. Genetics/Reproduction
F. Nutrition
G. Animal Health & Care

Student Learning Objectives

1.1 The student will be able to identify 5 breeds of beef, dairy, sheep, swine and horses.
1.2 The student will be able to select from a list of 10 terms and match the correct definitions of livestock terms and sex classifications.
1.3 The student will be able to identify 10 feed samples for livestock.
1.4 The student will be able to outline a program for the proper care of livestock.

Unit 2 - FFA/SOE Leadership (6 weeks)

A. Introduction to FFA

Student Learning Objectives

2.1 The student will learn the FFA Creed.
2.2 The student will be able to list 10 different types of SOE projects.
2.3 The student will be able to demonstrate 5 rules of parliamentary law.
2.4 The student will keep a record of his/her personal SOE.

Unit 3 - Fruit Production (2 weeks)

A. Fruit Industry
B. Variety Identification
C. Grading

Student Learning Objectives

3.1 The student will be able to identify 10 varieties of fruit grown in our area.

Unit 4 - Crop Production (2 weeks)

A. Identification of Washington Crops
B. Grasses and legumes
C. Cereal grains
D. Feed crops
E. Washington Ag. Statistics

Student Learning Objectives

4.1 The student will be able to identify 15 crops and weeds grown in Washington state.

Unit 5 - Shop Skills and Safety (6 weeks)

A. Hand tool and identification
B. Shop and tool safety
C. Skills projects - carpentry, rope, sheet metal
D. First aid

Student Learning Objectives

5.1 The student will be able to identify 15 common hand tools used in Agriculture.
5.2 The student will complete a safety test by a score of 90%.
5.3 The student will complete a project in carpentry, rope and sheet metal.

Unit 6 - Agricultural Occupations (2 weeks)

A. Introduction to agricultural occupations

Student Learning Objectives

6.1 The student will be able to list 5 production occupations.
6.2 The student will be able to list 5 agribusiness occupations.

Unit 7 - Tractor Driving/Maintenance/Safety (4 weeks)

A. External parts identification
B. Service and maintenance
C. Hitching and equipment
D. Safety
E. Driving skills

Student Learning Objectives

7.1 The student will be able to identify the operating controls of a tractor.
7.2 The student will be able to service and maintain a tractor.
7.3 The student will complete the Washington FFA tractor driving course.

Unit 8 - Gardening/Lawn Care and Maintenance (2 weeks)

A. ID and classification of garden crops
B. Planning and layout of a garden
C. Lawn care
D. Equipment maintenance

Student Learning Objectives

8.1 The student will be able to identify 15 garden vegetables.
8.2 The student will be able to plan and layout a garden.

Ag. Science 1 References

Working in Animal Sciences - McGraw/Hill

Livestock and Poultry Production - Prentice/Hall

FFA Manual

FFA Student Handbook

Roberts' Rules of Order

Crop Production - Prentice/Hall

Washington Farmer/Stockman

Organic Gardening and Farming

AAVIM Series

Oklahoma Series

Agriculture Science 2 Curriculum

Unit 1 - SOE/FFA Leadership (6 weeks)

A. Record books
B. Parliamentary procedure
C. Extemporaneous and public speaking
D. Program of activities

Student Learning Objectives

1.1 The student will be able to complete a FFA record book for his/her SOE.
1.2 The student will be able to write and present speeches and proper meeting procedures.
1.3 The student will be able to help develop the FFA program of activities for the chapter.

Unit 2 - Plant Science (7 weeks)

A. Plant structure
B. Growth and development
C. Reproduction
D. Germination
E. Field crop identification
F. Weed identification

Student Learning Objectives

2.1 The student will be able to describe the life cycles and function of the plant family.
2.2 The student will be able to identify the crops and weeds common to the Wenatchee area.

Unit 3 - Shop Skills (6 weeks)

A. Tap and die usage and safety
B. Arc welding
C. Oxy-acetylene welding and cutting
D. Welding safety

Student Learning Objectives

3.1 The student will be able to safely and properly use a tap and die tool set to produce nut and bolt threads.
3.2 The student will be able to safely produce welding skills in arc and oxy-acetylene welding and cutting.

Unit 4 - Fertilizers (3 weeks)

A. Plant nutrient identification
B. Fertilizer type and formulations
C. Application and storage

Student Learning Objectives

4.1 The student will be able to identify, apply and safely and properly handle fertilizers.

Unit 5 - Pesticides and Chemical Safety (5 weeks)

A. Pesticide identification
B. Pesticides formulations
C. Application equipment
D. Calibration of equipment
E. Safety and law

Student Learning Objectives

5.1 The student will be able to identify and properly use general and restricted use pesticides.
5.2 The student will be able to mix chemicals and calibrate the equipment for proper application rates.
5.3 The student will have the opportunity to obtain the Washington private applicator's license.

Unit 6 - Soils (3 weeks)

A. Origin and structure
B. Texture and profile
C. Soil water
D. Conservation and evaluation

Student Learning Objectives

6.1 The student will be able to identify the types of soil particles and what makes up a soil type and its usage.
6.2 The student will be able to soil test and evaluate the soil for its best usage and conservation practices.

Unit 7 - Animal Science (4 weeks)

A. Live animal evaluation
B. Live animal selection
C. Live animal judging

Student Learning Objectives

7.1 The student will be able to assess the best animal characteristics for the selection and usage of market and breeding livestock.

Agriculture Science 2 References

FFA Student Handbook

Washington Record Book

Roberts' Rules of Order

Program of Activities Planning Guide

Crop Production - Prentice Hall

Crop Samples - Own Collection - NASCO

Weed Samples - Own Collection - NASCO

Weeds of Eastern Washington - C.W. Hill/Printers

Farm Crops: Judging Identification and Grading - Maple Press Co.

Working in Plant Science - McGraw/Hill

Oklahoma Series

Oxy-Acetylene Welding - Goodheart/Wilcox

Arc Welding - Goodheart/Wilcox

Computer Disks from Hobar Publication

Fertilizer, Chemical and Seed - McGraw/Hill

Private Applicator's License Handbook - Washington Dept. of Ag.

Profitable Soil Management - Prentice/Hall

Livestock Judging and Evaluation - Cooperative Extension Service, Purdue Univ.

Working in Animal Science - McGraw/Hill

Agriculture Science 3 Curriculum

Unit 1 - SOE/FFA Leadership (4 weeks)

A. Record keeping
B. Applications for awards
C. Prepared and extemporaneous Speaking
D. Program of Activities

Student Learning Objectives

1.1 The student will be able to prepare the chapter program of activities.
1.2 The student will be able to use their record books to complete award applications.
1.3 The student will be able to prepare and present prepared and extemporaneous speeches.

Unit 2 - Agribusiness/Farm Management (9 weeks)

A. Definitions
B. Business structure
C. Cooperatives
D. Law
E. Insurance
F. Ag. finance (credit and loans)

Student Learning Objectives

2.1 The student will be able to define business and what principles apply to its operation.
2.2 The student will be able to understand the purpose of insurance.
2.3 The student will be able to apply for loans and understand the reasons for the regulations on borrowing.

Unit 3 - Agriculture Occupations/Job Readiness (3 weeks)

A. Career Awareness
B. Entering the job market

Student Learning Objectives

3.1 The student will be able to apply for a job and understand the importance in proper job seeking skills.

Unit 4 - Shop Skills (9 weeks)

A. Electricity
B. Plumbing
C. Concrete/construction

Student Learning Objectives

4.1 The student will be able to understand the principles of electricity and how to develop circuits and practice wiring skills.

4.2 The student will be able to identify plumbing parts and to properly assemble various types of plumbing systems.
4.3 The student will be able to work several concrete formulas and properly mix and pour concrete.

Unit 5 - Animal Science (9 weeks)
A. Carcass and meat evaluation
B. Genetics and reproduction

Student Learning Objectives
5.1 The student will be able to grade and identify retail cuts in beef, sheep and swine.
5.2 The student will be able to describe the reproduction system and the problems that may occur with genetics.

Agriculture Science 3 References

Official FFA Manual

Award Application Handbooks

Contest Handbook - Washington State and National

FFA Student Handbook

Program of Activities Planning Guide

Doane's Farm Management Guide

Oklahoma Series

Financial Planning in Agriculture - The Interstate Printers

Farm Management Computer Disks - Hobar Publications

World of Work - McKnight

AAVIM Series of Books on Electricity, Water and Plumbing

Meat Evaluation Handbook - National Meat Board

Uniform Retail Meat Identification Standards - National Meat Board

Meat Cuts Identification and Market Livestock and Carcass Evaluations

Working in Animal Science - McGraw/Hill

Agriculture Science 4 Curriculum

Unit 1 - SOE/FFA Leadership/Record Keeping (4 weeks)

A. Record keeping
B. Applications for Awards
C. Speeches
D. Program of Activities
E. Parliamentary Procedure

Student Learning Objectives

1.1 The student will be able to prepare the chapter program of activities.
1.2 The students will be able to use their record books to complete award applications.
1.3 The student will be able to prepare and present prepared and extemporaneous speeches.

Unit 2 - Agribusiness/Farm Management (9 weeks)

A. Taxes
B. Marketing
C. Budgeting

Student Learning Objectives

2.1 The student will be able to select the proper tax forms and utilize them effectively.
2.2 The student will be able to chart markets and how they effect buying and selling.
2.3 The student will be able to complete a financial budget and understand its planning function.

Unit 3 - Animal Science (9 weeks)

A. Feeds and Feeding
B. Animal Health
C. Animal Marketing

Student Learning Objectives

3.1 The student will be able to balance rations using the Morrison balancing method.
3.2 The student will be able to list the major animal health problems and their basic prevention and treatment.

Unit 4 - Shop Skills (12 weeks)

A. Electric motors
B. Controls, switches and relays
C. Gears, pulleys, sprockets, belts, and chains
D. Land measurement

Student Learning Objectives

4.1 The student will be able to identify the major types of electric motors.

4.2 The student will be able to select controls, switches and relays for use with electric motor equipment.
4.3 The student will be able to calculate speed, direction of travel, and the mechanical ability of each.
4.4 The student will be able to use a transit to take land measurements.

Unit 5 - Irrigation (2 weeks)
A. Systems
B. Equipment
C. Repair

Student Learning Objectives
5.1 The student will be able to select irrigation systems suitable for use in different field applications.
5.2 The student will be able to select and identify different types of irrigation equipment.
5.3 The student will be able to repair irrigation equipment.

Agriculture Science 4 References

Oklahoma Series

IRS Tax Education Series - Internal Revenue Service, Washington, D.C.

Doane's Farm Management Guide

Financial Planning in Agriculture/Interstate Printers

Farm Management Computer Disk - Hobar Publications

Morrison's Feeds and Feeding - Morrison Publishing Co.

Stockman's Handbook - Interstate Printers

Anchor Serum Animal Health Book - Anchor Serum Co.

Oklahoma Series

Newspapers - Wenatchee World - Thursday Edition

Washington Farmer/Stockman

Horticulture 1

Unit 1 - Plant Growth (2 weeks)
- A. Plant Parts
- B. Plant Reproduction

Student Learning Objectives
- 1.1 The student will be able to identify and label the parts of leaves, stems, roots and blossoms.
- 1.2 The student will be able to explain the difference between asexual and sexual reproduction.

Unit 2 - Propagation and Pruning (4 weeks)
- A. Propagation of plants
- B. Pruning

Student Learning Objectives
- 2.1 The student will propagate plants by asexual and sexual means in the greenhouse.
- 2.2 The student will be able to list advantages and disadvantages of sexual and asexual reproduction.
- 2.3 The student will describe the purpose of pruning and its function.
- 2.4 The student will demonstrate pruning to the satisfaction of the instructor.

Unit 3 - Leadership and SOE (4 weeks)
- A. Prepare speeches
- B. Parliamentary procedure
- C. Record books and record keeping

Student Learning Objectives
- 3.1 The student will prepare a 3-5 minute speech or report and present it orally.
- 3.2 The student will be able to demonstrate four motions and conduct a mock meeting.
- 3.3 The student will keep records on his/her SOE project and complete a net worth statement.

Unit 4 - Irrigation (3 weeks)
- A. Purpose of Irrigation
- B. Equipment
- C. Repair

Student Learning Objective
- 4.1 The student will explain the importance of water to the importance of plant growth.
- 4.2 The student will be able to select and identify different types of irrigation equipment.
- 4.3 The student will be able to repair irrigation equipment.

Unit 5 - Insects and Control (3 weeks)
- A. Types of insects
- B. Methods of Control

Student Learning Objectives
- 5.1 The student will be able to classify insects as insects or mites, ticks and spiders.
- 5.2 The student will be able to identify the major insect pests of the fruit industry.
- 5.3 The students will be able to explain 3 methods to control insects.

Unit 6 - Pesticides and pesticide safety (2 weeks)
- A. Classes of pesticides
- B. Lable Information
- C. Safety

Student Learning Objectives
- 6.1 The student will be able to identify the pests and pesticide used to control pests.
- 6.2 The student will be able to read the label and identify the pests it will control.
- 6.3 The student will be able to identify the warning signs on the label and safe handling, mixing and application of pesticide.

Unit 7 - Horticulture Occupations and Careers (2 weeks)
- A. Agriculture Occupations
- B. Careers in Horticulture

Student Learning Objectives
- 7.1 The student will make a list of 10 Horticulture occupations in the Wenatchee Valley.
- 7.2 The students will choose 2 careers in Horticulture and research each to find salary, education or training needed, and job openings.

Unit 8 - Shop Skills (9 weeks)
- A. Electricity
- B. Plumbing
- C. Concrete/construction

Student Learning Objectives
- 8.1 The student will be able to understand electricity and how to make duplex and light installations.
- 8.2 The student will be able to identify different types of plumbing fittings and complete a simple plumbing project.
- 8.3 The student will be able to set up forms, pour and finish concrete to a smooth surface.

Unit 9 - Orchard management (7 weeks)

A. Fruit marketing
B. Storage and packing
C. Horvesting

Student Learning Objectives

9.1 The student will be able to identify apples of extra fancy, fancy and 3rd grade of red and golden delicious apples along with identifying apple blemishes common to the fruit industry.
9.2 The student will make a graph showing the price difference between the three grades of apples.
9.3 The student will be able to identify apple sizes of 64 - 138.
9.4 The student will describe the different types of storage systems for fruit and give advantages and disadvantages of regular storage or C.A. storage.
9.5 The student will perform two tests to determine the best time for fruit harvest.

Horticulture 1 References

Official FFA Manual

Awards Application Handbook

Oklahoma Series

Washington Horticulture Series

Tree Fruit Production - County Extension Bulletin

Tree Fruit Spray Guide - County Extension Bulletin

AAVIM Series on Electricity, Water and Plumbing

Advanced Horticulture 2

Unit 1 - Fruit Production Regions and History (1 week)
- A. Varieties
- B. Washington Apple Production

Student Learning Objectives
- 1.1 The student will be able to identify 10 varieties of apples, 3 varieties of pears, and 5 varieties of soft fruits.
- 1.2 The student will be able to identify the fruit growing regions of our state and nation.
- 1.3 The student will be able to describe the early origin of fruit production.

Unit 2 - SOE and Record Keeping (1 week)
- A. Applications and records

Student Learning Objectives
- 2.1 The student will be able to possess a S.O.E. project in which accurate records of time, earnings and learning achievement are kept.

Unit 3 - Leadership and Salesmanship (4 weeks)
- A. Prepared speaking
- B. Parliamentary procedure
- C. Personal growth and work
- D. Making decisions

Student Learning Objectives
- 3.1 The student will be able to prepare a 5 minute speech to be given orally in class.
- 3.2 The student will be able to demonstrate the correct use of parliamentary procedure in a mock meeting.
- 3.3 The student will be able to identify personal occupational goals and describe characteristics that lead to work.
- 3.4 The student will be able to describe the importance of sound decisions and outline plans for making sound decisions.

Unit 4 - Horticultural Job Skills (2 weeks)
- A. Human relations in agribusiness
- B. Job applications
- C. Job interviews
- D. Handling money

Student Learning Objectives
- 4.1 The student will be able to identify 6 ways to influence people.
- 4.2 The student will accurately complete an application form and correctly prepare a letter for mock employment with a personal data sheet.

4.3 The student will be able to experience an actual oral job interview for mock employment.
4.4 The student will be able to identify 4 steps in developing a personal budget and outline ways to secure money-management assistance.

Unit 5 - Plant Growth and Propagation (4 weeks)
A. Plant parts and functions
B. Growth and reproduction
C. Budding and grafting

Student Learning Objectives
5.1 The student will be able to identify 4 plant structures and describe the functions of each.
5.2 The student will be able to describe photosynthesis, respiration, transpiration, and translocation.
5.3 The student will be able to outline the process by which a plant grows from seed to maturity.
5.4 The student will be able to describe the process by which fruit trees reproduce and explain which method of asexual propagation is used for specific trees.
5.5 The student will be able to perform actual budding and grafting on various forms of fruit wood.

Unit 6 - Soils and Fertilization (4 weeks)
A. Origin and profiles
B. Texture and moisture
C. Soil chemistry and testing
D. Soil nutrients and applications

Student Learning Objectives
6.1 The student will be able to describe the physical characteristics of soil.
6.2 The student will be able to identify by sample 3 soil texture types and describe soil water relationships.
6.3 The student will be able to describe soil pH and its effect on plant growth and perform actual soil pH testing.
6.4 The student will be able to identify 5 soil nutrients and explain their use and application in orchards.

Unit 7 - Insect and Disease Management (4 weeks)
A. Pesticide application and safety
B. Insecticides formulations and calibration
C. Orchard insect identification
D. Orchard diseases and fungicides

Student Learning Objectives
7.1 The student will be able to define integrated pest management,

identify 10 different pesticides, and outline their safe usage.

7.2 The student will be able to identify 3 general types of insecticides and explain how each is used.

7.3 The student will be able to identify 5 orchard insect pests and describe their life cycles.

7.4 The student will be able to identify 3 orchard diseases and outline the use of fungicides for disease control.

Unit 8 - Orchard Pest Control Management (1 week)

A. Rodent and bird identification and control
B. Orchard weed identification and control

Student Learning Objectives

8.1 The student will be able to identify 2 rodent pests and 3 bird pests of orchards and outline their control.

8.2 The student will be able to identify 10 orchard weeds and outline their control.

Unit 9 - Planting, Pruning and Tree Training (2 weeks)

A. Orchard planning and tree selection
B. Planting, pruning and training equipment
C. Controlling tree growth

Student Learning Objectives

9.1 The student will be able to identify the characteristics of regular and high-density plantings and describe the selection of a root stock.

9.2 The student will be able to give specific details of timing, digging, and planting fruit trees.

9.3 The student will be able to outline steps of controlling and training tree growth from planting time to maturity.

Unit 10 - Orchard Irrigation (1 week)

A. Irrigation systems
B. Soil water and evaporation

Student Learning Objectives

10.1 The student will be able to identify 3 orchard irrigation systems and discuss the advantages and disadvantages of each.

10.2 The student will be able to describe the movement of soil moisture and identify critical watering periods in fruit production.

Unit 11 - Harvesting and Marketing (2 weeks)

A. Fruit maturity and harvest dates

B. Field testing fruit maturity
C. Fruit marketing alternatives

Student Learning Objectives

11.1 The student will be able to perform 3 fruit maturity tests (ie.) iodine, pressure and refractometer.
11.2 The student will be able to calculate the optimum harvest date by using the blooming date maturity method.
11.3 The student will be able to demonstrate the proper procedure of picking and handling apples.
11.4 The student will be able to identify 3 marketing methods a grower may use and describe advantages and disadvantages of each.

Unit 12 - Packing and Storage (1 week)

A. Fruit grading
B. Common and controlled atmosphere storage systems

Student Learning Objectives

12.1 The student will be able to identify 3 grades of apples.
12.2 The student will be able to outline the packing process from receiving to transporting.
12.3 The student will be able to compare 2 types of storage systems and describe how each is used.

Unit 13 - Orchard Skills (8 weeks)

A. Planting
B. Pruning and tree training
C. Fertilization
D. Irrigation
E. Mowing and spraying
F. Fruit harvest

Student Learning Objectives

13.1 The student will be able to practice safe work habits at all times while working in the orchard.
13.2 The student will be able to perform minor maintenance to hand tools and orchard equipment (ie.) sharpen and adjust loppers and saws, lubricate mower and sprayer, adjust belts, replace guards, fuel and check oil and coolant levels.
13.3 The student will be able to plant young fruit trees using correct procedures (ie.) direction of bud, depth, and root placement.
13.4 The student will be able to prune various aged fruit trees and training limbs for angle and direction.
13.5 The student will be able to calibrate and adjust for the correct pounds per acre of fertilizer and operate safely a power fertilizer spreader.
13.6 The student will be able to calculate the gallons per minute

and gallons per acre requirement for growing apples. Replace and/or adjust impact and rotor type sprinklers and make repairs on P.V.C. pipe.

13.7 The student will be able to operate a tractor and P.T.O. driven mower and describe the hazards of its operation.

13.8 The student will be able to operate a P.T.O. driven sprayer and outline the steps of safe handling of pesticide materials while mixing and applying.

13.9 The student will be able to perform preharvest tasks (ie.) securing labor, determining fruit maturity, mapping harvest procedure, and contacting the warehouse.

13.10 The student will be able to participate in an apple harvest (ie.) direct labor, track fruit quality, move loaded bins, interpret warehouse packout information, calculate costs, and prepare a final production summary.

Advanced Horticulture 2 References

Apple Production Guide for Vocational Agriculture

Succeeding in the World of Work - Kimbrell & Vineyard; McKnight Pub.

Working in Horticulture - Richardson & Moore; McGraw-Hill

Washington Handbook of Awards and Contests

Washington State Standards for Apples; Washington State Department of Agriculture

Field Trips: Cascadian Fruit Shippers
Skookum Growers
Witte Packing
Northwest Wholesales
Van Well Nursery

Agriculture Welding

Course Objectives: To provide entry level skills and knowledge to perform simple welds and repair equipment on the home farm, or use the course information as a foundation towards a study in welding beyond an introductory level.

Unit 1 - Welding Theory (1 week)

A. Metal identification
B. Identify gas and arc welding equipment
C. Welding processes

Student Learning Objectives

1.1 The student will be able to identify the major metals used in metals fabrication.
1.2 The student will be able to identify welding equipment used for gas and arc welding.
1.3 The student will be able to describe the welding process and fusion.

Unit 2 - Arc Welding (2 weeks)

A. Advantages and Disadvantages
B. Electrodes and Positions
C. Welding symbols
D. Arc Welding Equipment
E. Arc Welding Safety
F. Demonstrations

Student Learning Objectives

2.1 The student will be able to explain advantages and disadvantages of arc welding.
2.2 The student will be able to identify types of electrodes and demonstrate welding positions.
2.3 The student will be able to identify common welding symbols.
2.4 The student will be able to set up the equipment and describe how the equipment works.
2.5 The student will be able to pass a safety test with at least 90% accuracy.

Unit 3 - Oxy-Acetylene Welding and Cutting (2 weeks)

A. Advantages and Disadvantages
B. Properties of gases and cylinders
C. Equipment identity
D. Flame types
E. Gas Welding safety

Student Learning Objectives

3.1 The student will be able to list the advantages and disadvantages of gas welding.

3.2 The student will be able to list and identify the different types of gases and cylinders used in gas welding.
3.3 The student will be able to identify the different tyeps of gas welding equipment and label the parts of a gas welding set-up.
3.4 The student will be able to identify and adjust a torch to the various flame types.
3.5 The student will be able to pass a safety test with at least 90% accuracy.

Unit 4 - Shop Skills Performance Items (12 weeks)
A. Arc Welding
B. Gas Welding

Student Learning Objectives
4.1 The student will be able to perform the following arc projects to the satisfaction of the instructor: Beads flat, Pat weld, Butt no grove, Three pass butt, Single pass T-weld, Lap weld flat, Vertical T-weld up or down, Horizontal Beads, Corner Weld, Object weld around, Weave weld, and Mig welding.
4.2 The student will be able to perform the following gas welds to the satisfaction of the instructor: Beads without rod, Beads with rod, Butt weld, lap weld, V-weld, T-weld flat, Pipe weld, Thick to thin lap weld, cutting - flat and pipe, Brazing beads, Braze Butt, Brazing - pipe to flat iron.

Agriculture Welding References

Modern Welding - Goodheart/Wilcox

Lincoln Welding Pamphlets

Victor Gas Welding Pamphlets

Arc Welding - Goodheart/Wilcox

O-A Welding - Goodheart/Wilcox

Oklahoma Series

Small Engines

Unit 1 - Engine Theory (8 weeks)

A. Engine design, parts ID and operation
B. 2 vs. 4 cycle operation
C. Engine ignition
D. Engine cooling
E. Engine carburetion
F. Engine lubrication
G. Measurement/use of micrometers

Student Learning Objectives

1.1 The student will be able to identify the parts of a small gas engine.
1.2 The student will be able to describe the theory of the internal combustion engine.
1.3 The student will be able to read a micrometer.
1.4 The student will be able to list the differences between a 2 stroke cycle and 4 stroke cycle engine.

Unit 2 - Pre-shop Skills (1 week)

A. Parts ID
B. Tool ID
C. Shop Safety

Student Learning Objectives

2.1 The student will be able to identify 25 tools used on small gas engines.
2.2 The student will be able to complete a safety test by a score of 90%.

Unit 3 - Shop Skills (8 weeks)

A. Disassembly
B. Measurement
C. Decision making
D. Parts ordering
E. Repair
F. Reassembly
G. Start

Student Learning Objectives

3.1 The student will be able to diassemble, measure and reassemble a 4 stroke cycle small gas engine.

Small Engine References

Small Gas Engines, Alfred C. Roth, Goodheart/Wilcox

Briggs & Stratton Service & Repair Instructions

Briggs & Stratton General Theories of Operation

Small Engines, Volume 1, AAVIM

Small Engines, Volume 2, AAVIM

Small Air Cooled Engines - Service Manual, Technical Publications Div., Intertec Pub. Corp.

Tecursek Engine Mechanics Handbooks

Small Engine Mechanics, William H. Crouse & Donald L. Anglin, McGraw-Hill Pub.

Agricultural Power Mechanics

Unit 1 - Orientation to agriculture power (1 week)
- A. Principles of mechanical power
- B. Career planning

Student Learning Objectives
- 1.1 The student will be able to explain the importance of power and machinery in modern agriculture.
- 1.2 The student will be able to identify and explain terms which describe power, mechanical advantage, and torque.
- 1.3 The student will be able to describe entry requirements for employment in the various jobs available in agricultural power and machinery.

Unit 2 - S.O.E. and Leadership (1 week)
- A. Project record keeping
- B. Invoices, receipts, and work records

Student Learning Objectives
- 2.1 The student will be able to possess a S.O.E. project in which accurate records of time, earnings, and learning achievement are kept.
- 2.2 The student will be able to maintain accurate records of work time per shop project and develop model invoices, bills, and receipts.

Unit 3 - Shop Safety and First Aid (1 week)
- A. Hand tool use, maintenance, and safety
- B. Power tool use, service, and safety

Student Learning Objectives
- 3.1 The student will be able to identify and describe the safe usage or operation of the hand tools and equipment of a power shop.
- 3.2 The student will be able to identify an emergency situation and describe correct procedures for preventing or solving.

Unit 4 - Internal Combustion (6 weeks)
- A. Principles of engine operation
- B. Internal combustion engine components
- C. Spark-ignition gasoline engine components
- D. Compression-ignition diesel engine operation
- E. Engine operation and service

Student Learning Objectives
- 4.1 The student will be able to describe and identify the operating principles of the internal combustion engine.
- 4.2 The student will be able to identify the basic parts of the

gasoline and diesel internal combustion engines and compare operation.

4.3 The student will be able to identify the parts of the carburetion and fuel injection systems and explain their operation.

4.4 The student will be able to identify the parts of the valve-intake and exhaust system and explain its operation.

4.5 The student will be able to identify the parts of the ignition system and explain its operation.

Unit 5 - Power Drive Assemblies (4 weeks)

A. Clutches
B. Transmissions and differentials
C. Power takeoff and power transfer

Student Learning Objectives

5.1 The student will be able to identify and describe the components of the power train assembly.

5.2 The student will be able to identify the various clutches and their parts and describe their operation.

5.3 The student will be able to identify the type and purpose of gears, transmission parts and operation, and differentials parts and operation.

Unit 6 - Hydraulic Power (4 weeks)

A. Fundamentals, operation and service
B. Lifting and drive systems
C. Pumps and motors
D. Valves and cylinders

Student Learning Objectives

6.1 The student will be able to describe the operating principles of hydraulic power.

6.2 The student will be able to identify the basic components of a hydraulic system and explain it's operation.

6.3 The student will be able to identify the parts of a hydraulic motor and pump and describe their operation.

6.4 The student will be able to identify and describe the working parts of various hydraulic operated devices.

Unit 7 - Shop Skills (16 weeks)

A. Safety inspection and first aid
B. Hand tool identification and service
C. Power tool identification and service
D. Engine component identification
E. Engine measurement and testing
F. Cylinder head and valve service
G. Piston and cylinder service

H. Block, bearings, and seals service
I. Lubrication and preventive maintenance
J. Tune-up and minor repair
K. Engine overhaul, operation and testing
L. Fuel systems and carburetor service
M. Cooling system service
N. Brake system service and repair

Student Learning Objectives

7.1 The student will be able to practice safe working habits at all times while in the shop area.
7.2 The student will be able to perform maintenance skills to hand tools, shop equipment, and actual working engines (ie.) lubrication, electrical, air intake, fluid levels and filters.
7.3 The student will be able to identify the components of the internal combustion engine and describe their function.
7.4 The student will be able to perform measurement and testing of actual engine parts and working engines.
7.5 The student will be able to perform minor repair and tune-up on working engines (ie.) ignition system components, timing of a spark-ignition engine, intake and exhaust valves, carburetors, brakes, wheel bearings and universal joints.
7.6 The student will be able to perform service repairs on actual engines (ie.) cylinder head service, piston and rod assembly service, camshaft service, and crankshaft service.

Power Mechanics References

Primary text: Agriculture Power & Machinery, Jacobs & Harrell; copyright 1983, Mcgraw/Hill Publishers

John Deere/Fundamentals of Service Series:
1. Engines
2. Hydraulics
3. Power Trains

Auto Mechanics Fundamentals, Stockel, Goodheart/Wilcox, Pub.
J.D. F.O.S. Series

Filmstrips: Bergwell Series

Fieldtrips: Valley Tractor
Rocky Reach Dam
Cascade Chevrolet
Lloyd's Truck Repair
Young's Transmission